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**Comparative study of social networks
in post-socialist Western Balkan countries.
Formal and informal networking for information
diffusion**

Abstract

Rural areas in the Western Balkan are faced with severe socio-economic and political challenges, including a lack of access to knowledge and information as well as scepticism about formal forms of cooperation. Yet, the evidence regarding the influence of social capital and network structures on the access of the rural population to information and knowledge in these countries is still sparse, even though this can be one of the most influential factors shaping rural development. In this paper, a multi-country comparison was applied to provide empirical evidence of the existing level of social capital structures (networks) in North Macedonia, Serbia and Bosnia and Herzegovina. The conducted analyses

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indicate that even with the low participation rates, all farmers, both members and non-members of organisations, perceived membership in formal organisations as useful. Additionally, the results support the presumption that even sparse informal networks, mostly built on strong personal ties, are more effective channels for information transfer in the absence of efficient/active formalised types of cooperation. This implies that rural development policy should be crafted in a way to transform farmers from passive subjects into creative actors, particularly in sharing and promoting good practices.

Keywords: social capital, rural development, transition, Western Balkan.

Introduction

Social networks and the underlying social capital are gaining increasing attention in studying information flow in rural areas. Social network analysis and social capital theory could provide a relevant framework to study post-socialist rural economies and their information systems. Early evidence from Putnam (1993) showed that in the absence of developed institutional settings, different types of social structures appeared to foster cooperation among individuals. In that context, Stiglitz (1999) supported the presumption that identified informal social networks are common structures in the post-transition economies, defining community resilience. Evidence shows that in the absence of efficient formal information systems (formal organisations), informal social networks are considered as a powerful information source to rural people. For instance, Murray (2006) emphasised that the lack of efficient formal governance structures affects the behaviour of the rural population in creating certain social capital patterns in rural areas. In support of this evidence, Ahlerup et al. (2009) confirmed the effect of social capital vanishing as institutions get stronger. Mikiewicz and Szafraniec (2009) underplayed the importance of local leaders' role in the process of building social capital in rural areas, while more recently, Righia (2013) and Stam et al. (2014) found that social networks can act as a substitute for formal institutions.

These findings are relevant for Western Balkan countries, whose rural areas are undergoing rapid changes and structural transformation. The transition from central planning to a free-market economy has led to

liberalisation, decentralisation and devolution of numerous services to the private sector, whereas new forms of institutions and institutional arrangements are only partially developed. In an institutional vacuum, a wide array of actors (farmers, consumers, entrepreneurs, traders, local communities and self-government) change their behaviour by establishing diverse operational models and new organisational structures to better respond to the new business environment. The absence of formal rules, procedures and (weak) enforcement pushed them to establish a new type of networks and linkages to heighten their benefits but also to permit certain selected aspects of the transaction process to be covered by the existing framework.

Although there is a vast literature on the issue in the context of information sharing systems, still the evidence addressing this issue in the rural areas in the Western Balkans is scarce. Several separate studies outlined social capital in Bosnia and Herzegovina, Serbia and North Macedonia (UNDP 2009; Bogdanov and Janković 2013; Tuna et al. 2014) but there is no systematic comparative study regarding the complex and multidimensional changes of information systems in the rural areas in these countries. Therefore, we provide comparable empirical evidence for North Macedonia, Serbia and Bosnia and Herzegovina on how social network structures influence the access to information on rural development policies (RDP). Cross country research could contribute to addressing important questions such as: i) what are the prevailing attitudes and perceptions of participating in different types of information sharing networks (formal and informal) in regard to RDP? ii) is the structure and performance of existing social networks a true reflection of the attitudes and expectation? iii) if the key actors in the information-sharing networks can be identified and then involved as the well-connected “‘agents of change’ which can speed up the evolution of new institutions to contribute to rural development?

Considering that certain structures of formal cooperation in all the analysed countries exist, we provide research in regions with formal and informal networking models to understand the different structures that support information diffusion in rural areas. This study aimed to serve as a base for developing effective, evidence-based models of information exchange systems for RDP support in these countries. The results may have wider applicability if they are replicated to national contexts within other post-socialist countries.

The following section describes the social network analysis tools and the sampling approach applied to describe social networks as common structures of social capital in rural areas and their impact on information diffusion, followed by presentation of the results, discussion and a conclusion in line with the social network analysis and social capital theory.

Materials and method

Following the conceptual framework of social capital theory, we applied a two-stage approach to provide comparable empirical evidence for three Western Balkan countries on how social network structures influence the access to information on RDPs.

The first phase presents the farmers' general attitudes towards cooperation, and in the second phase, we applied the social network analysis to investigate the information diffusion on policies related to the development of rural areas, both in formal and informal settings. In the second stage, that was dedicated to a deeper understanding of farmers' socio-economic behaviour with special attention to the diffusion of information, social network analysis was applied to present relations among actors in a specific network using specialised tools for analysis (measurement) and visualisation using UCINET and NETdraw software (Borgatti et al. 2002). The second research phase focused on the visualisation of the RDP information-sharing network.

For the purpose of this research, three parallel face-to-face surveys were conducted in North Macedonia, Serbia and Bosnia and Herzegovina in the period from November to December 2014. Due to the diverse characteristics of rural areas in the selected countries, the research was performed in six regions (two per country), thus, a stratified sampling procedure was used to divide the sample into two groups according to whether there is an existing institutionalised form of cooperation i.e. (i) region with existing network organisation (cooperatives, producers' groups, civil society organisations (CSOs) and intermediate organisations), here called the ENO region, and (ii) region with less developed or no network organisation, here called the NNO region. The choice of region was based on the presumption that there are differences in the level of social capital and the patterns of information flow in the different regions. The sample

size was 300 respondents per country and 150 per stratum (or circa 900 respondents in total).

Data regarding farmers' general attitudes towards cooperation was gathered via a structured survey, including questions scored on a five-point disagree (1) – agree (5) (Likert-type) scale. Since most responses were presented on an ordinal scale, simple descriptive statistics were applied to sketch the sample and the general response, whereas non-parametric tests (Kruskal-Wallis and Mann Whitney tests) were used as a post-hoc procedure to detect the differences between countries and regions. Evidence gathered by such analysis served as a tool for the general assessment of used social capital proxies as membership of local associations and networks, trust and adherence to norms, as well as the level of collective action.

Social network data was collected using the 'network-generating' table, which collects information for each farmer's relations with other farmers or existing actors in the information-sharing network (Lin, 2005; Wasserman and Faust, 1994). To motivate farmers to appoint others, each of the surveyed farmers was asked to nominate a certain number (most often three to five) of people with whom they discussed or shared information on important issues (Lin, 2005; Wasserman and Faust, 1994). The sample was created using a personal-network approach, which is recommended when a complete list of actors in the network (the subject of the analysis) is unavailable (Borgatti et al. 2013). This approach can contribute to identifying more and different actors in the network as well as constructing larger and richer social networks.

Social network analysis uses the descriptive properties of networks, such as size, density, strength of ties, etc. (Bodin et al. 2011, Rockenbauch and Sakdapolarak 2017). Several basic network cohesion measures were used as indicators of social capital levels in the analysed networks. Density is one of the primary indicators of social capital and networks with higher density values expected to exhibit higher levels of social capital and capacity for collective action due to the more frequent interactions and relations established by the actors. Furthermore, increased interactions among the actors in the network lead to increased trust and potential for information sharing (Bodin and Corona 2009). On a deeper, ego level, "average degree" provides a valuable signal for the level of social capital, or more specifically, the average number of ties (received – in-degree and initiated – out-degree) that each ego establishes with its alters. The number of relations is taken as

a proxy measure of social capital, that is, the higher number of ties indicates stronger social cohesion (Lin 2005), and in this case, cooperation (social capital) in terms of RDP information sharing among the farmers and other actors in the rural areas.

Results and discussion

To present the level and patterns of social, Table I provides a descriptive representation of the membership rate perceptions of benefits by participation in different types of organisation and the quality of relations between ENO and NNO regions.

Low participation in organisations creates weak structures of formal social interactions/networks. However, regardless of the evident low participation rates in the formal organisation in all the analysed countries (of the total respondents, 90% in N. Macedonia, 84% in Serbia and 60% in Bosnia and Herzegovina are not members in any type of formal organisation), most respondents viewed membership in organisations as useful (4 on a scale from 1-disagree to 5-agree), and think that it can bring individual and group benefits. Respondents are also aware that the existence of organisations is very important in facilitating common actions necessary to foster rural development.

Despite the very low rate of membership in organisations, most of the surveyed respondents frequently cooperate with other farmers on an informal level (around 30% of the farmers in all three countries, always cooperate/share information with other farmers), suggesting that informal social networks among farmers exist. The individual intention and frequency of information dissemination (share) can be interpreted as an existing potential to strengthen all types of social networks, as well as social capital. Nonetheless, the effectiveness and usefulness of social networks are questionable. The largest number of farmers who never share information with other farmers can be found in Bosnia and Herzegovina (18.1% in the NNO region), whereas in North Macedonia and Bosnia and Herzegovina, respondents tend to cooperate more frequently than they do in Serbia. In Serbia and North Macedonia, the need to solve common problems is the most often cited reason for cooperation, and informal socialisation is most important in Bosnia and Herzegovina. In all three countries, information

Table 1. Respondents' perceptions of benefits by participation in different types of organisation and the quality of relations between ENO and NNO regions (mean scores from the questionnaire)

| Benefits | Macedonia | | | Serbia | | | Bosnia and Herzegovina | | |
|---|-----------|-------|-------|--------|-------|-------|------------------------|-------------|-------|
| | Total | ENO | NNO | Total | ENO | NNO | Total | ENO | NNO |
| Farmer's attitudes towards formal cooperation | | | | | | | | | |
| 1. Membership in formal organisations | | | | | | | | | |
| Non-members (%) | 90.30 | 86.00 | 94.63 | 84.00 | 88.00 | 80.00 | 59.66 | 30.14 | 88.59 |
| 2. Perceptions of benefits by participation in different organisations | | | | | | | | | |
| In general, membership in an organisation is useful | 3.95 | 4.49 | 3.40* | 4.02 | 3.97 | 4.07 | 4.04 | 4.26 | 3.83* |
| Organisations provide assistance when preparing for a RDP application | 3.25 | 3.85 | 2.65* | 3.14 | 3.21 | 3.08 | 3.56 | 3.76 | 3.38* |
| Members of organisations get bank credit more easily | 3.08 | 3.41 | 2.74* | 3.11 | 3.19 | 3.03* | 3.40 | 3.47 | 3.34 |
| Organisations contribute to the development of the village | 3.81 | 4.30 | 3.32* | 3.84 | 3.86 | 3.83 | 3.89 | 4.08 | 3.69* |
| 3. Quality of relations between members within different organisations | | | | | | | | | |
| People in organisations think only of themselves and their interests | 2.95 | 2.28 | 3.62* | 3.07 | 3.25 | 2.89* | 2.86 | 2.70 | 3.03* |
| Organisations are formed only to use money from funds | 2.91 | 2.15 | 3.68* | 2.91 | 3.20 | 2.63* | 2.79 | 2.54 | 3.04* |

Table 1. Respondents' perceptions of benefits by participation in different types of organisation and the quality of relations between ENO and NNO regions (mean scores from the questionnaire)

| Benefits | Macedonia | | | Serbia | | | Bosnia and Herzegovina | | |
|--|-----------|-------|--------|--------|-------|--------|------------------------|-------|--------|
| | Total | ENO | NNO | Total | ENO | NNO | Total | ENO | NNO |
| Farmer's attitudes towards formal cooperation | | | | | | | | | |
| 3. Quality of relations between members within different organisations | | | | | | | | | |
| I believe that members in organisations respect joint agreements | 3.32 | 3.89 | 2.74* | 3.21 | 3.27 | 3.15 | 3.35 | 3.50 | 3.21* |
| Being a member of an organisation does not stop me freely making decisions for my farm | 3.81 | 4.11 | 3.50* | 3.70 | 3.55 | 3.85* | 4.01 | 4.31 | 3.72* |
| The process of joint decision-making works well | 3.17 | 4.05 | 2.29* | 3.13 | 3.08 | 3.19 | 3.55 | 3.83 | 3.28* |
| Farmer's attitudes towards informal cooperation | | | | | | | | | |
| 1. % of farmers that always cooperate with other farmers | 26.10 | 29.33 | 22.76 | 43.33 | 32.00 | 54.67* | 25.34 | 32.65 | 18.1* |
| 2. Reasons for cooperation with other farmers (%) | | | | | | | | | |
| Information exchange | 16.91 | 21.03 | 8.18* | 20.95 | 14.00 | 26.24* | 4.97 | 4.17 | 6.02 |
| Common problems | 39.07 | 36.48 | 44.55* | 48.60 | 55.00 | 43.73 | 40.31 | 40.74 | 39.76* |
| Technical support | 12.54 | 15.88 | 5.45* | 3.89 | 2.50 | 4.94 | 4.71 | 4.17 | 5.42 |
| Informal socialisation | 31.49 | 26.61 | 41.82 | 26.57 | 28.50 | 25.10 | 50.00 | 50.93 | 48.80* |

* Statistically significant difference between the regions (Mann-Whitney test) at .05 level of significance.

exchange is less important, with technical support being the least common reason for cooperation.

Social networks – basic social structures

Social network analysis was applied to assess the structure and quality of social capital, capacity to improve it, as well as its cohesion and propulsive force. The performance of a social network is an excellent proxy for the accessibility to social capital and in this case, the performance is measured by the capability of information diffusion. Various network cohesion measures of the “RDP information-sharing network” are presented in Table 2. The visualisation of the networks is presented through sociograms in Figures 1 to 6.

Table 2. *Network cohesion measures*

| Measure | Range and explanations | Macedonia | | Serbia | | Bosnia and Herzegovina | |
|-----------------------|--|-----------|-------|--------|-------|------------------------|-------|
| | | ENO | NNO | ENO | NNO | ENO | NNO |
| Average degree | Average number of ties of each node | 1.018 | 2.023 | 1.098 | 1.126 | 2.153 | 1.980 |
| In degree (H-index) | Average of ties received by each node | 4 | 6 | 5 | 5 | 7 | 7 |
| Degree centralisation | | 0.018 | 0.041 | 0.020 | 0.018 | 0.017 | 0.004 |
| Out-Central | | 0.018 | 0.041 | 0.020 | 0.018 | 0.017 | 0.004 |
| In-Central | | 1.131 | 0.041 | 0.009 | 0.010 | 0.021 | 0.009 |
| Density | Values closer to 1 – better connectedness of the actors in the network | 0.006 | 0.012 | 0.002 | 0.002 | 0.005 | 0.003 |
| Components | Number of components comprising the network | 140 | 76 | 436 | 477 | 60 | 73 |

Table 2. *Network cohesion measures*

| Measure | Range and explanations | Macedonia | | Serbia | | Bosnia and Herzegovina | |
|------------------|---|-----------|-------|--------|-------|------------------------|-------|
| | | ENO | NNO | ENO | NNO | ENO | NNO |
| Component ratio | 1 – every node is isolate, 0 – there is one component | 0.822 | 0.434 | 0.973 | 0.952 | 0.125 | 0.105 |
| Connectedness | 1 – each node belongs to the same component, 0 – every node is in a different component | 0.029 | 0.080 | 0.007 | 0.007 | 0.180 | 0.115 |
| Fragmentation | 1 – all nodes are at distance 1 from each other (complete graph), 0 – all nodes are isolates | 0.971 | 0.920 | 0.993 | 0.993 | 0.820 | 0.885 |
| Closure | | 0.032 | 0.201 | 0.084 | 0.196 | 0.154 | 0.053 |
| Average distance | The time length for information diffusion across the network | 2.966 | 3.745 | 2.444 | 2.633 | 8.459 | 9.726 |
| SD distance | Sees distances beyond actors' direct relations | 1.581 | 2.221 | 1.442 | 1.597 | 4.206 | 5.302 |
| Diameter | | 8 | 13 | 7 | 8 | 23 | 26 |
| Breadth | Average distance among nodes when certain nodes in the networks are removed (when all nodes are distance 1 from each other – complete graph, and 0 when all nodes are isolates) | 0.987 | 0.968 | 0.996 | 0.996 | 0.968 | 0.981 |
| Compactness | | 0.013 | 0.032 | 0.004 | 0.004 | 0.032 | 0.019 |

Table 2. Network cohesion measures

| Measure | Range and explanations | Macedonia | | Serbia | | Bosnia and Herzegovina | |
|------------------|---|-----------|-------|--------|-------|------------------------|-------|
| | | ENO | NNO | ENO | NNO | ENO | NNO |
| Reciprocity | Average reciprocated ties (ties in both directions) | 0.335 | 0.540 | 0.045 | 0.082 | 0.890 | 0.940 |
| Dyad reciprocity | Reciprocity between pairs of nodes | 0.201 | 0.370 | 0.023 | 0.043 | 0.801 | 0.886 |

The *density measures* in all countries are low, indicating very low levels of trust among the analysed individuals from the rural regions, resulting in large network disconnections (values close to 0) and poorly connected and sparse networks. This, however, requires cautious interpretation, as complete enumeration of all the actors was not available in the sampling procedure. The *average degree* (the average number of relations that each of the farmers has with other farmers) is another indicator of social capital, and in all three countries, the average degree is also very low (two relations per farmer). However, the *average in-degree* (the number of nominations that each farmer receives from others in the network), as a more valuable measure of social capital and a measure of interaction among farmers is quite high (6 ties per person), Surprisingly, with no significant differences between ENO and NNO regions, meaning that social capital on informal level exists regardless of the existing or non-existent organisation in the region. The *reciprocity* measure (ties that go in both directions) denotes the degree of cohesion and social capital as a measure of trust and information exchange. The reciprocity level is highest in Bosnia and Herzegovina, where over 80% of the ties are reciprocated in both regions, pointing to relatively intensive information sharing on the dyad (between two actors) level. The same measures are much lower in North Macedonia and the lowest in Serbia. The *component ratio* expresses high segmentation or a large number of components in all sub-regions. Nevertheless, the sociograms display that most networks consist of one major and many smaller components. The *average distance* is looking beyond direct relations and denoting the time

or steps needed for the RDP information to diffuse among the network. Apart from the large number of components, the average distance among the observed farmers is relatively low in the case of Serbia (1.5 steps), North Macedonia (3.5 steps) and much higher in Bosnia and Herzegovina (9 steps). The case of Bosnia and Herzegovina is also different when it comes to the *network diameter* or the steps between any pair of actors in the network. RDP information travels much slower in Bosnia and Herzegovina (average of 25 steps), taking much fewer (8–13 steps) for the information on RDP to reach the furthest actor in North Macedonia and Serbia. The information networks in North Macedonia are of a different structure, with an evident concentration of informational flow in the ENO region, where a successful agricultural cooperative operates (see Table 2).

North Macedonia: The network structure in the NNO region in North Macedonia comprises nine components, which is close to the number of villages (12) included in the survey, indicating the geographical concentration of social capital. An important aspect is the equal position of actors throughout the network, which may be the result of the absence of a farmer-driven organisation. In that regard, only two nodes have a degree of 9 and 10 and relatively lower eigenvector centrality (a measure of the influence a node has on a network – if a node is pointed to by many nodes which also have high eigenvector centrality) and betweenness values (% of ties that go through a certain node) compared to the network in the ENO region, and neither of those nodes are members of a formal organisation. In the ENO region, two dominant nodes are largest (largest degree – have the largest number of direct and indirect connections with others farmers), and these individuals participate in the management of the existing agricultural cooperative in the region, thus hold a powerful position in the information transfer (see Figure 1). This is also expressed in the higher values of betweenness, a measure calculated on an ego level for certain individuals which were identified as possible information brokers between other nodes in this network.

Serbia: Both sub-regions in Serbia comprise a great number of components, but most nodes belong to one larger component (292 red nodes – Figure 3, and 360 purple nodes – Figure 4). The highest degree levels in the ENO region span from 8 to 12 relations. The node with the highest degree value is not a member of any organisation. Three other nodes in this network have a degree value of 10, with relatively high betweenness

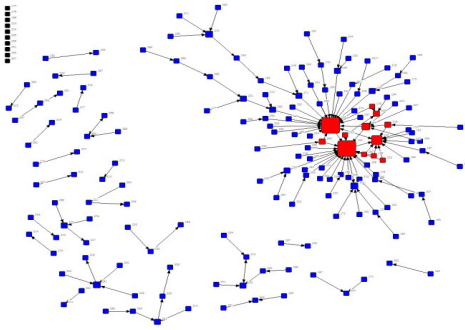


Figure 1. Macedonia: Region with an existing network organisation (ENO)



Figure 2. Macedonia: Region without an existing network organisation (NNO)

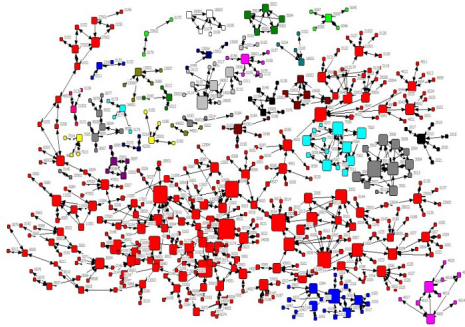


Figure 3. Serbia: Region with an existing network organisation (ENO)

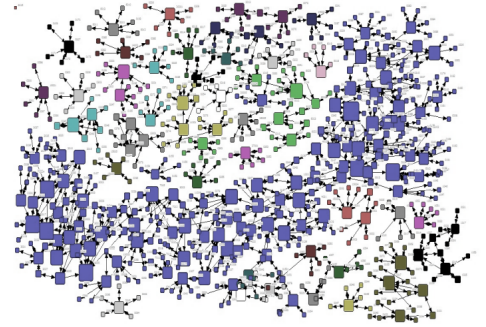


Figure 4. Serbia: Region without an existing network organisation (NNO)

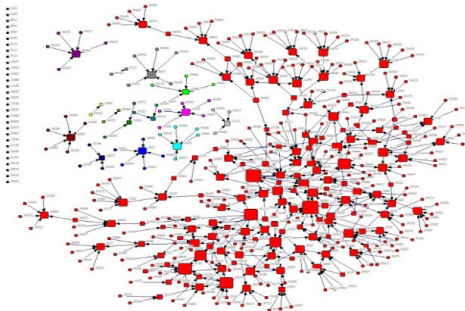


Figure 5. Bosnia and Herzegovina (BA): Region with an existing network organisation (ENO)

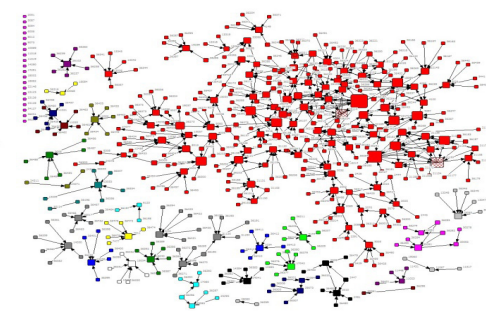


Figure 6. Bosnia and Herzegovina (BA): Region without an existing network organisation (NNO)

Note. Node size represents the degree of each actor; different colours represent different components.

and a higher eigenvector value for node 2005 (not a member of any organisation). This means that these actors are nominated most frequently and lie on the path of the informational flow in this network, suggesting that those individuals can be characterised as 'agent of change', or persons facilitating the exchange of information. The network in the NNO region in Serbia consists of one larger component and many smaller ego networks, as well as including more actors, most of whom are members of a professional organisation, with similar and smaller average node degree (8–9), and smaller betweenness values.

In Bosnia and Herzegovina, the structures of both networks are very similar, with many peripheral and unconnected nodes, as well as many farmers (nodes) who did not report any relations with other farmers on an informal level suggesting that many farmers are distant both in geographical and sociological terms and do not discuss RDP matters with other farmers. Most farmers' relations in the ENO region are situated in the major component (357 nodes), which is a sign of the possibility for efficient transfer of information among the connected actors. Four actors have a degree of 10 to 15, all are members of a formal organisation, confirming that membership in organisations contributes to the development of richer networks and easier access to RDP information. In the NNO region, most nodes belong to one component composed of 303 nodes. Three nodes stand out in this region with a degree of over 10 and only one of them is a member of a formal organisation.

Conclusions

Each society has a distinguishing structure and level of social capital, which is determined by the historical, cultural and political background (Granovetter 1985). Consequently, post-socialistic countries that are challenged by severe socio-economic and political weaknesses are expected to exhibit higher distrust in institutionalised and governmentally supported forms of socio-economic cooperation and higher levels of social capital on an informal level. This paper aimed to provide evidence regarding the level and structure of social capital among the rural population, with emphasis on the information flow regarding the RDP in North Macedonia, Serbia and Bosnia and Herzegovina. The similar historical, political and economic

background showed that the surveyed countries have many similarities but also many differences in the RDP information-sharing networks. There was a similarity in the still present low levels of trust and hesitancy concerning cooperation in some formal (institutional) form of cooperation, but there was a generally positive attitude towards the benefits from cooperative actions. This condition was our first proxy for measuring the structure and the level of social capital.

Our initial expectations were that farmers would still oppose the idea of cooperation and joint activities for mutual benefits because of the distorted views on formal cooperation inherited from the ex-socialistic system (Paldam and Svendsen 2000; Chloupkova et al. 2003). Nevertheless, this research indicates that even with the low participation rates, all farmers, both members and non-members of organisations, perceived membership in formal organisations (e.g. cooperative or professional associations) as useful. It appears that the positive experience increases positive attitudes of members towards the quality of relations within organisations. Such findings raise hope that farmers' inclination to join some type of organisation will increase in the near future, mostly through their involvement with existing and new organisations in their areas. Thus, to strengthen the structure of formal social interactions, positive attitudes towards membership should be more actively encouraged and disseminated in rural areas.

When institutionalised forms of cooperation are absent or underdeveloped, people in rural areas are presumed to rely more on relationships preserved in their cohesive, informal networks for reaching common goals that are important for the rural development (Kadushin, 2012). Informal networks are present and functional in all three countries, however, they are usually very dispersed and mostly built on strong personal ties among two/three farmers (these most often are relationships among close friends and family). This affects the information sharing patterns, the ability to undertake common actions and the quality of such actions.

The network analysis revealed large differences in the structure and the number of actors in the informal networks. Moreover, there are also evident differences between the regions with an existing functional organisation, where information about support for rural development is more accessible and concentrated between smaller numbers of actors. Most actors which hold such a "powerful" position in the network are members of some

form of formal institution, indicating that membership in different types of organisation may be beneficial for increased access to information and higher levels of social capital. Identifying these individuals could contribute to the process of constructing cooperation models in which these powerful individuals may have a valuable role as information transfer brokers.

Conversely, the regions without existing organisations have more equal dispersion on an ego level and no individuals particularly stand out in the information transfer. This could indicate that farmers in a region with an existing cooperative may have better access to information, whether as a member of the cooperative or on an informal level, by being connected to other members of the existing cooperative (other existing organisation in the region). This must be considered when rural development measures are created. It means that the introductory phase that promotes and informs about possibilities offered by rural development policy must be longer, more intensive and more creative by also introducing some social innovations. This can be a decisive factor behind the constant policy failures faced by the post-socialist countries in introducing the cooperation models that are not context-based.

The interplay of the existing formal and informal networks facilitates the development of more efficient and connected social networks in rural areas. Nonetheless, it is quite difficult to institutionalise the informal networks, as they do not evolve as fast as necessary during periods of transition. The evidence in this research discloses that there are differences in the social network structures on a country level, but also differences within each country, depending on the existence or non-existence of certain formal organisations in rural areas. Therefore, developing, promoting and supporting networking activities and strategies sensitive to the micro-social context are expected to create better information networks that can transfer information for the RDP, ultimately contributing to the development of the rural areas. Strategies to promote cooperation should consider the observed mismatch between the positive attitude towards organisations and actual behaviour (low membership rate). They should be based on farmers' motivations and built on positive experiences of membership, positive attitudes towards the usefulness of organisations, their contributions to the public interest and their ability to ensure good and fair relationships while preserving personal integrity.

To summarise, development of social capital in the Western Balkan post-socialist countries should gain importance, as it can largely contribute to the rural development by improved information flow on the rural development policy. Understanding the current formal and informal social structures may contribute to laying the ground for strengthening rural institutional and social governance structures. These structures are an especially important development stimulator of agriculture which is the main source of income in rural areas in the Western Balkans. In fact, the repeated social interactions among farmers in rural areas may suggest a pattern that may be used as a base for development of more organised systems and models for efficient transfer of information and resources in the post-socialist environment.

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Appendices

Table 3. *Definition of basic network cohesion measures*

| Social network measures | Range | Meaning |
|--------------------------------|---|---|
| Density | Values closer to 1: better connectedness of actors. Values close to 0 indicate a complete network disconnection. | Ratio between the number of possible ties in one population and the ties which are present. Larger density = indicator of higher levels of trust. |
| Average degree | For non-symmetric data, this represents the average of nodes in-degree (number of ties received by a node) and out-degree (number of ties initiated by a node). | Indicator for the level of social capital, but on an individual level. Information on the number of each individual's relations = the number of ties that each ego establishes with its alters. |
| Reciprocity | Number of reciprocated ties, important in directed ties: % of reciprocated ties, divided by the total number of ties. | Expresses the degree of cohesion, trust and presence or absence of social capital. |
| Average distance | Important macro-characteristic of the network as a whole. Greater distances = longer time for information to diffuse across a population. | Looks beyond actors' direct relations – how individuals are embedded in networks through their close or distant actors. |
| Betweenness centrality | % of ties that go through a certain node (number of times certain node lay on the path between different sets of actors in the network). | Actors with higher values expected to have a stronger position in the networks (social capital generating points) – possibilities to control information and resources. |
| Average reciprocity | Number (%) of reciprocated ties (ties in both directions) among the actors in the network | Degree of cohesion, levels of trust and information exchange. Highly dependent on network size: in large populations, most actors have no direct ties to most other actors. |

Table 3. *Definition of basic network cohesion measures*

| Social network measures | Range | Meaning |
|--------------------------------|---|--|
| Diameter | Number of ties, or the maximum distance between any pair of nodes in the network. | Longest path along which the information might flow; how distant the remotest two actors are in the network. |
| Network fragmentation | Average distance among nodes when certain nodes in the networks are removed. Values range from 1 = all nodes are distant from each other (complete graph), to 0 = all nodes are isolates. | Distance-weighted fragmentation ('breadth') – expectation that the graphs would be disconnected (average distance among nodes when certain nodes in the networks are removed). |
| Component ratio | 1 (max.): every node is an isolate; 0 (min.): there is just one component. | Normalised measure – the larger the main component (number of nodes), greater is the global network cohesion. |
| Connectedness | 1 (max.): every node is in the same component; 0 (min.): every node is in a different component. | Share of node pairs that can reach each other by a path of any length (belong to the same component). |

Source: Coleman, 1988; Wasserman and Faust, 1994; Hanneman and Riddle, 2005; Borgatti et al., 2013.